Low Cost/Low Noise Variable Pitch Ducted Fan, Phase I

Completed Technology Project (2005 - 2006)

Project Introduction

ACI proposes a design for a Propulsor (Low Cost/Low Noise Variable Pitch Ducted Fan) that has wide application in all sectors of Aviation. Propulsor hardware of this low cost design can be integrated with a broad range of aircraft engines (e.g. existing piston engines, automotive derivative piston engines, new design turbine engines) for use in new design aircraft. The proposed Propulsor design will incorporate known acoustic design features that support low noise aircraft operation. These features include the use of duct acoustic liners, attenuating harmonic stator vane and rotor blade configurations, and duct designs that direct/condition the exhaust air stream to minimize noise heard by individuals on the ground during aircraft takeoff, landing, and fly-over. The proposed Propulsor design makes possible the fabrication of low cost and low weight variable pitch fan blades and rotors. The new composite blade/retention design avoids the need for heavy and expensive ball bearings and other complex hub pitch change mechanism components.

Anticipated Benefits

ACI's proposed Propulsor (Low Cost/Low Noise Variable Pitch Ducted Fan) design has wide application in Aviation beyond just General Aviation. In Military Aviation, the ACI design low cost Propulsors are particularly well suited for applcations such as in VSTOL vehicles (e.g. twin counter rotating ducted lift fans, UAV vehicles where low noise signature is critical to mission success, and helicopter tail rotors. In Commercial Aviation, the Propulsor low cost design can be used for fans in turbofan engines such as the ADP (Advanced Ducted, ACI's proposed Propulsor (Low Cost/Low Noise Variable Pitch Ducted Fan) design makes possible the manufacture of low noise and low cost aircraft propulsion systems. The Propulsor design implementation in personal air vehicles (PAV) will make possible compliance with growing low noise restrictions. Importantly, the low cost Propulsor design will help NASA meet its PAV cost targets. This will help pave the way for high volume PAV aircraft sales in the future and realization of the NASA PAV/GA vision.

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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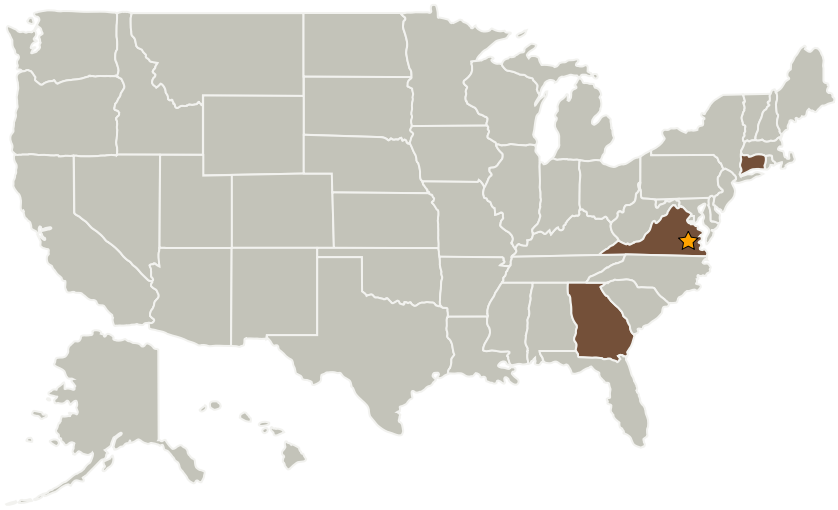
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Aerocomposites, Inc.	Supporting Organization	Industry	KENSINGTON, Connecticut
Georgia Tech Applied Research Corporation	Supporting Organization	Academia	Atlanta, Georgia

Primary U.S. Work Locations	
Connecticut	Georgia
Virginia	

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Project Manager:
Mark D Moore

Principal Investigator:
John Violette

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.1 Integrated Systems and Ancillary Technologies